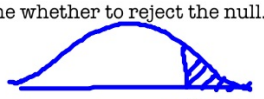
Testing a claim: P-value Method

Reject null when P-value < alpha

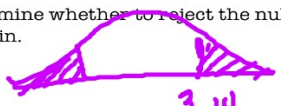
During the 2000 season, the home team won 138 games of the 240 regular season NFL games. Test the claim that the home team wins more than 50% of the time. Alpha = 0.10 (P-value method)

n = 240

1. State H_o & H_a; write a sentence for the claim $H_o: p = .50$ $H_a: p > .50$ claim: *The home team wins more than 50% of the time.*	2. State the assumptions. 1 SRS 2 binomial 3 $np \geq 5$ $nq \geq 5$ $120 \geq 5$ ✓ $120 \geq 5$ ✓	3. State when to reject null for p-value method. reject H_o if pvalue $< .10$
4. Calculate the test statistic. $Z = \frac{(138/240 - .5)}{\sqrt{\frac{.5 \times .5}{240}}} = 2.324$	5. Sketch and find the p-value. Determine whether to reject the null. Explain.  2.324 Pvalue = normcdf(2.324, 888) = .0101 reject H_o; $.0101 < .10$	6. Conclusion p.380 *The sample data supports the claim that the home team wins more than 50% of the time.*

National data in the 1960's showed about 44% of the adult population never smoked cigarettes. In 1995, a national health survey interviewed a random sample of 980 adults and found that 480 never smoked cigarettes. Test the claim that the percentage of adults that have never smoked is 44%. Use a significance level of 0.01. (Pvalue method)

$\hat{p} = 480/980$

1. State H_o & H_a; write a sentence for the claim $H_o: p = .44$ $H_a: p \neq .44$ *Claim: The percentage of adults that have never smoked is 44%*	**2.** State the assumptions. SRS ✓ binomial ✓ $np \geq 5$ $nq \geq 5$ ✓ $431.2 \geq 5$ ✓ $548.8 \geq 5$	**3.** State when to reject null for p-value method. reject H_o if pvalue $< .01$
4. Calculate the test statistic. $z = \frac{(480/980 - .44)}{\sqrt{\frac{.44 \times .56}{980}}} = 3.140$	**5.** Sketch and find the p-value. Determine whether to reject the null. Explain.  3.14 Pvalue = ncdf(3.14, 99999) × 2 = .00169 reject H_o: $.00169 < .01$	**6.** Conclusion *There is sufficient evidence to warrant rejection of the claim that 44% of adults have never smoked.*

Census data for a certain county shows that 19% of adult residents are Hispanic. Suppose 72 people are randomly selected for jury duty and only 9 are Hispanic. Test the claim that less than 19% of jurors are Hispanic. Use p-value method.

1. State H_o & H_a; write a sentence for the claim	2. State the assumptions.	3. State when to reject null for p-value method.
4. Calculate the test statistic.	5. Sketch and find the p-value. Determine whether to reject the null. Explain.	6. Conclusion

Find the p-value.

Null: The administration is telling the truth
Alternative: The administration is lying